

Notice of Allowability	Application No. 10/050,908 Examiner Michael J Feely	Applicant(s) KHANDROS ET AL. Art Unit 1712
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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTO-85) or other appropriate communication will be mailed in due course. THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS. This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. This communication is responsive to amendment filed 10/24/03.
2. The allowed claim(s) is/are 1-64.
3. The drawings filed on 18 January 2002 are accepted by the Examiner.
4. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some*
 - c) None of the:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

5. Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 - (a) The translation of the foreign language provisional application has been received.
6. Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE**

7. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) hereto or 2) to Paper No. _____.
 - (b) including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
 - (c) including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the margin according to 37 CFR 1.121(d).

9. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

<input type="checkbox"/> Notice of References Cited (PTO-892)	<input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
<input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	<input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No. <u>0104</u>
<input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No. <u>0803</u>	<input checked="" type="checkbox"/> Examiner's Amendment/Comment
<input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material	<input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance
	<input type="checkbox"/> Other

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with N. Kenneth Burraston (Reg. No. 39,923) on January 8, 2004.

The application has been amended as follows:

In the Claims:

In claim 1, replace lines 1-6 with:

--A probe cleaning apparatus for cleaning the end portion of a probe used for testing a semiconductor wafer, comprising:

- (i) an abrasive substrate layer comprising a material for loosening debris on the end portion of a probe; and
- (ii) a tacky gel layer, wherein said tacky gel layer is in contact with a surface of the abrasive substrate layer; said tacky gel layer comprising: -- .

In claim 1 after Formula II,

Replace: "wherein, R_{1'}, R_{2'}, R_{3'}, R_{4'}, R_{5'}, m' and n' are independently selected from the groups defining R₁, R₂, R₃, R₄, R₅, m and n above, with the proviso that vinyl is not present; or"

With: --wherein, R_{1'}, R_{2'}, R_{3'}, R_{4'}, R_{5'}, m' and n' are independently selected from the groups defining R₁, R₂, R₃, R₄, R₅, m and n above, with the proviso that vinyl is not present in Formula II and that Formula II has at least two Si-H bonds; or -- .

In claim 1 after Formula III,

Replace: "R₆, R₇, R₈, R₉, R₁₀, and R₁₁ are independently selected from: hydrogen, C₁₋₂₀ alkyl, C₁₋₂₀ haloalkyl, phenyl or C₁₋₁₀ alkylphenyl;"

With: --R₆, R₇, R₈, R₉, R₁₀, and R₁₁ are independently selected from: hydrogen, C₁₋₂₀ alkyl, C₁₋₂₀ haloalkyl, phenyl or C₁₋₁₀ alkylphenyl, with the proviso that Formula III has at least two Si-H bonds; -- .

2. (Amended) The probe cleaning apparatus according to claim 1, wherein said abrasive substrate layer is comprised of a material selected from the group consisting of a transition metal, metal alloy, composite compound, and naturally occurring material.

3. (Amended) The probe cleaning apparatus according to claim 2, wherein said material is in the form of a powder, particle, granule or crystal.

4. (Amended) The probe cleaning apparatus according to claim 3, wherein said abrasive substrate layer is homogeneous or heterogeneous.

5. (Amended) The probe cleaning apparatus according to claim 2, wherein said abrasive substrate layer is comprised of a transition metal selected from the group consisting of copper, nickel, palladium, tungsten, rhenium, rhodium, and cobalt.
6. (Amended) The probe cleaning apparatus according to claim 2, wherein said abrasive substrate layer is comprised of a metal alloy selected from the group consisting of palladium/cobalt, molybdenum/chromium, and titanium/tungsten.
7. (Amended) The probe cleaning apparatus according to claim 2, wherein said abrasive substrate layer is comprised of a composite compound selected from the group consisting of tungsten carbide, silicon carbide, silicon nitride, silicon oxide, aluminum nitride, chrome oxide, and titanium nitride.
8. (Amended) The probe cleaning apparatus according to claim 2, wherein said abrasive substrate layer is comprised of a naturally occurring material selected from the group consisting of silica, alumina, diamond, and diamond-like carbon.
9. (Amended) The probe cleaning apparatus according to claim 2, wherein said abrasive substrate layer comprises surface abrasions obtained from one or more selected from the group consisting of surface roughening, plating up, etching, stamping, cutting into the substrate surface, molding, and sputtering.

In claim 10, replace line 1-6 with:

--A probe cleaning apparatus for cleaning the end portion of a probe used for testing a semiconductor wafer, comprising:

(i) an abrasive substrate layer; and

(ii) a tacky gel layer, wherein said tacky gel layer is in contact with a surface of the abrasive substrate layer, said tacky gel layer comprising: -- .

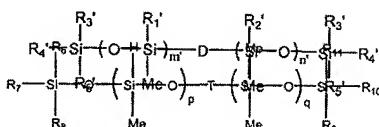
In claim 10, after Formula II,

Replace: "wherein, R₁, R₂, R₃, R₄, R₅, m' and n' are independently selected from the groups defining R₁, R₂, R₃, R₄, R₅, m and n above, with the proviso that vinyl is not present; or"

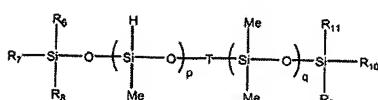
With: --wherein, R₁', R₂', R₃', R₄', R₅', m' and n' are independently selected from the groups defining R₁, R₂, R₃, R₄, R₅, m and n above, with the proviso that vinyl is not present in Formula II and that Formula II has at least two Si-H bonds; or -- .

In claim 10,

Replace (Formula III):



With (Formula III):



In claim 10 after Formula III,

Replace: “R₆, R₇, R₈, R₉, R₁₀, and R₁₁ are independently selected from: hydrogen, C₁₋₂₀ alkyl, C₁₋₂₀ haloalkyl, phenyl or C₁₋₁₀ alkylphenyl;”

With: --R₆, R₇, R₈, R₉, R₁₀, and R₁₁ are independently selected from: hydrogen, C₁₋₂₀ alkyl, C₁₋₂₀ haloalkyl, phenyl or C₁₋₁₀ alkylphenyl, with the proviso that Formula III has at least two Si-H bonds; -- .

11. (Amended) The probe cleaning apparatus according to claim 10, wherin said alternating regions of the tacky gel layer rest on a surface of said abrasive substrate layer, or said alternating regions of the tacky gel layer are partially embedded in said abrasive substrate layer.

In claim 12, after Formula II,

Replace: “wherein, R₁, R₂, R₃, R₄, R₅, m' and n' are independently selected from the groups defining R₁, R₂, R₃, R₄, R₅, m and n above, with the proviso that vinyl is not present; or”

With: --wherein, R₁, R₂, R₃, R₄, R₅, m' and n' are independently selected from the groups defining R₁, R₂, R₃, R₄, R₅, m and n above, with the proviso that vinyl is not present in Formula II and that Formula II has at least two Si-H bonds; or -- .

In claim 12, after Formula III,

Replace: “R₆, R₇, R₈, R₉, R₁₀, and R₁₁ are independently selected from: hydrogen, C₁₋₂₀ alkyl, C₁₋₂₀ haloalkyl, phenyl or C₁₋₁₀ alkylphenyl;”

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With: --R₆, R₇, R₈, R₉, R₁₀, and R₁₁ are independently selected from: hydrogen, C₁₋₂₀ alkyl, C₁₋₂₀ haloalkyl, phenyl or C₁₋₁₀ alkylphenyl, with the proviso that Formula III has at least two Si-H bonds; -- .

In claim 29, replace lines 1-6 with:

--A probe cleaning apparatus for cleaning the end portion of a probe used for testing a semiconductor wafer, comprising:

(i) an abrasive substrate layer comprising a material for loosening debris on the end portion of a probe; and

(ii) a tacky gel layer, wherein said tacky gel layer is in contact with a surface of the abrasive substrate layer; said tacky gel layer comprising: -- .

30. (Amended) The probe cleaning apparatus according to claim 29, wherein said abrasive substrate layer is comprised of a material selected from the group consisting of a transition metal, metal alloy, composite compound, and naturally occurring material.

31. (Amended) The probe cleaning apparatus according to claim 30, wherein said material is in the form of a powder, particle, granule or crystal.

32. (Amended) The probe cleaning apparatus according to claim 31, wherein said abrasive substrate layer is homogeneous or heterogeneous.

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33. (Amended) The probe cleaning apparatus according to claim 30, wherein said abrasive substrate layer is comprised of a transition metal selected from the group consisting of copper, nickel, palladium, tungsten, rhenium, rhodium, and cobalt.

34. (Amended) The probe cleaning apparatus according to claim 30, wherein said abrasive substrate layer is comprised of a metal alloy selected from the group consisting of palladium/cobalt, molybdenum/chromium, and titanium/tungsten.

35. (Amended) The probe cleaning apparatus according to claim 30, wherein said abrasive substrate layer is comprised of a composite compound selected from the group consisting of tungsten carbide, silicon carbide, silicon nitride, silicon oxide, aluminum nitride, chrome oxide, and titanium nitride.

36. (Amended) The probe cleaning apparatus according to claim 30, wherein said abrasive substrate layer is comprised of a naturally occurring material selected from the group consisting of silica, alumina, diamond, and diamond-like carbon.

37. (Amended) The probe cleaning apparatus according to claim 29, wherein said abrasive substrate layer comprises surface abrasions obtained from one or more selected from the group consisting of surface roughening, plating up, etching, stamping, cutting into the substrate surface, molding, and sputtering.

In claim 38, replace line 1-6 with:

--A probe cleaning apparatus for cleaning the end portion of a probe used for testing a semiconductor wafer, comprising:

- (i) an abrasive substrate layer; and
- (ii) a tacky gel layer, wherein said tacky gel layer is in contact with a surface of the abrasive substrate layer, said tacky gel layer comprising: -- .

39. (Amended) The probe cleaning apparatus according to claim 10, wherein said alternating regions of the tacky gel layer rest on a surface of said abrasive substrate layer, or said alternating regions of the tacky gel layer are partially embedded in said abrasive substrate layer.

In claim 47, replace line 1-6 with:

--A probe cleaning apparatus for cleaning the end portion of a probe used for testing a semiconductor wafer, comprising:

- (i) an abrasive substrate layer; and
- (ii) a tacky gel layer, wherein said tacky gel layer is in contact with a surface of the abrasive substrate layer, said tacky gel layer comprising: -- .

In claim 47, after Formula II,

Replace: "wherein, R₁, R₂, R₃', R₄, R₅', m' and n' are independently selected from the groups defining R₁, R₂, R₃, R₄, R₅, m and n above, with the proviso that vinyl is not present; or"

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With: --wherein, R₁, R₂, R₃, R₄, R₅, m' and n' are independently selected from the groups defining R₁, R₂, R₃, R₄, R₅, m and n above, with the proviso that vinyl is not present in Formula II and that Formula II has at least two Si-H bonds; or -- .

In claim 47, after Formula III,

Replace: "R₆, R₇, R₈, R₉, R₁₀, and R₁₁ are independently selected from: hydrogen, C₁₋₂₀ alkyl, C₁₋₂₀ haloalkyl, phenyl or C₁₋₁₀ alkylphenyl;"

With: --R₆, R₇, R₈, R₉, R₁₀, and R₁₁ are independently selected from: hydrogen, C₁₋₂₀ alkyl, C₁₋₂₀ haloalkyl, phenyl or C₁₋₁₀ alkylphenyl, with the proviso that Formula III has at least two Si-H bonds; -- .

In claim 48, replace line 1-6 with:

--A probe cleaning apparatus for cleaning the end portion of a probe used for testing a semiconductor wafer, comprising:

- (i) an abrasive substrate layer; and
- (ii) a tacky gel layer, wherein said tacky gel layer is in contact with a surface of the abrasive substrate layer, said tacky gel layer comprising: -- .

In claim 48, after Formula II,

Replace: "wherein, R₁, R₂, R₃, R₄, R₅, m' and n' are independently selected from the groups defining R₁, R₂, R₃, R₄, R₅, m and n above, with the proviso that vinyl is not present; or"

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With: --wherein, R_{1'}, R_{2'}, R_{3'}, R_{4'}, R_{5'}, m' and n' are independently selected from the groups defining R₁, R₂, R₃, R₄, R₅, m and n above, with the proviso that vinyl is not present in Formula II and that Formula II has at least two Si-H bonds; or -- .

In claim 48, after Formula III,

Replace: "R₆, R₇, R₈, R₉, R₁₀, and R₁₁ are independently selected from: hydrogen, C₁₋₂₀ alkyl, C₁₋₂₀ haloalkyl, phenyl or C₁₋₁₀ alkylphenyl;"

With: --R₆, R₇, R₈, R₉, R₁₀, and R₁₁ are independently selected from: hydrogen, C₁₋₂₀ alkyl, C₁₋₂₀ haloalkyl, phenyl or C₁₋₁₀ alkylphenyl, with the proviso that Formula III has at least two Si-H bonds; -- .

In claim 55, replace line 1-6 with:

--A probe cleaning apparatus for cleaning the end portion of a probe used for testing a semiconductor wafer, comprising:

- (i) an abrasive substrate layer; and
- (ii) a tacky gel layer, wherein said tacky gel layer is in contact with a surface of the abrasive substrate layer, said tacky gel layer comprising: -- .

In claim 55, after Formula II,

Replace: "wherein, R₁, R_{2'}, R_{3'}, R_{4'}, R_{5'}, m' and n' are independently selected from the groups defining R₁, R₂, R₃, R₄, R₅, m and n above, with the proviso that vinyl is not present; or"

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With: --wherein, R₁, R₂, R₃, R₄, R₅, m' and n' are independently selected from the groups defining R₁, R₂, R₃, R₄, R₅, m and n above, with the proviso that vinyl is not present in Formula II and that Formula II has at least two Si-H bonds; or -- .

In claim 55, after Formula III,

Replace: "R₆, R₇, R₈, R₉, R₁₀, and R₁₁ are independently selected from: hydrogen, C₁₋₂₀ alkyl, C₁₋₂₀ haloalkyl, phenyl or C₁₋₁₀ alkylphenyl;"

With: --R₆, R₇, R₈, R₉, R₁₀, and R₁₁ are independently selected from: hydrogen, C₁₋₂₀ alkyl, C₁₋₂₀ haloalkyl, phenyl or C₁₋₁₀ alkylphenyl, with the proviso that Formula III has at least two Si-H bonds; -- .

In claim 60, replace line 1-6 with:

--A probe cleaning apparatus for cleaning the end portion of a probe used for testing a semiconductor wafer, comprising:

- (i) an abrasive substrate layer; and
- (ii) a tacky gel layer, wherein said tacky gel layer is in contact with a surface of the abrasive substrate layer, said tacky gel layer comprising: -- .

In claim 61, replace line 1-6 with:

--A probe cleaning apparatus for cleaning the end portion of a probe used for testing a semiconductor wafer, comprising:

(i) an abrasive substrate layer; and

(ii) a tacky gel layer, wherein said tacky gel layer is in contact with a surface of the abrasive substrate layer, said tacky gel layer comprising: -- .

In claim 61, after Formula II,

Replace: "wherein, R₁, R₂, R₃, R₄, R₅, m' and n' are independently selected from the groups defining R₁, R₂, R₃, R₄, R₅, m and n above, with the proviso that vinyl is not present; or"

With: --wherein, R₁, R₂, R₃, R₄, R₅, m' and n' are independently selected from the groups defining R₁, R₂, R₃, R₄, R₅, m and n above, with the proviso that vinyl is not present in Formula II and that Formula II has at least two Si-H bonds; or -- .

In claim 61, after Formula III,

Replace: "R₆, R₇, R₈, R₉, R₁₀, and R₁₁ are independently selected from: hydrogen, C₁₋₂₀ alkyl, C₁₋₂₀ haloalkyl, phenyl or C₁₋₁₀ alkylphenyl;"

With: --R₆, R₇, R₈, R₉, R₁₀, and R₁₁ are independently selected from: hydrogen, C₁₋₂₀ alkyl, C₁₋₂₀ haloalkyl, phenyl or C₁₋₁₀ alkylphenyl, with the proviso that Formula III has at least two Si-H bonds; -- .

In claim 62, replace line 1-6 with:

--A probe cleaning apparatus for cleaning the end portion of a probe used for testing a semiconductor wafer, comprising:

(i) an abrasive substrate layer; and

(ii) a tacky gel layer, wherein said tacky gel layer is in contact with a surface of the abrasive substrate layer, said tacky gel layer comprising: -- .

63. (Amended) The probe cleaning apparatus according to claim 1, wherein said abrasive substrate layer comprises abrasions, wherein at least two of said abrasions have a spacing between said at least two abrasions, wherein said spacing is smaller than the width of a probe tip.

64. (Amended) The probe cleaning apparatus according to claim 29, wherein said abrasive substrate layer comprises abrasions, wherein at least two of said abrasions have a spacing between said at least two abrasions, wherein said spacing is smaller than the width of a probe tip.

Allowable Subject Matter

2. Claims 1-64 are allowed.

3. The following is an examiner's statement of reasons for allowance:

Independent claim 1 and dependent claims 2-9, 18-28, 46, 49, 51-54, and 63:

The closest prior art is Lo (US Pat. No. 4,774,111). Claim 1 has been amended to include the following limitation: "(i) an abrasive substrate layer comprising a material for loosening debris on the end portion of a probe". The claim also includes the following preamble language:

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“A probe cleaning apparatus for cleaning the end portion of a probe used for testing a semiconductor wafer”. Previously, the preamble was not given patentable weight; however, the new language breathes life into the preamble. Lo teaches an article similar to the one of the instant invention; however, he does not teach an abrasive substrate layer comprising a material for loosening debris on the end portion of a probe. The substrate in Lo is broadly disclosed as “substantially smooth or rough,” (column 13, lines 1-5). Furthermore, the article of Lo is not a probe cleaning apparatus.

Dependent claims 2-9, 18-28, 46, 49, 51-54, and 63 are allowed because they depend from claim 1.

Independent claim 10 and dependent claim 11:

Claims 10 and 11 are allowed for the reasons set forth in § 22 of the previous Office action.

Independent claim 12 and dependent claims 13-17:

Claims 12-17 are allowed for the reasons set forth in § 22 of the previous Office action.

Independent claim 29 and dependent claims 30-37, 50, 56-59, and 64:

The closest prior art is Lo (US Pat. No. 4,774,111). Claim 29 has been amended to include the following limitation: “(i) an abrasive substrate layer comprising a material for loosening debris on the end portion of a probe”. The claim also includes the following preamble language: “A probe cleaning apparatus for cleaning the end portion of a probe used for testing a semiconductor wafer”. Previously, the preamble was not given patentable weight; however, the new language breathes life into the preamble. Lo teaches an article similar to the one of the instant invention; however, he does not teach an abrasive substrate layer comprising a material

for loosening debris on the end portion of a probe. The substrate in Lo is broadly disclosed as "substantially smooth or rough," (column 13, lines 1-5). Furthermore, the article of Lo is not a probe cleaning apparatus.

Dependent claims 30-37, 50, 56-59, and 64 are allowed because they depend from claim 29.

Independent claim 38 and dependent claim 39:

Claims 38 and 39 are allowed for the reasons set forth in § 22 of the previous Office action.

Independent claims 40 and dependent claims 41-45:

Claims 40-45 are allowed for the reasons set forth in § 22 of the previous Office action.

Independent claims 47, 48, 55, 60, 61, and 62:

Claims 47, 48, 55, 60, 61, and 62 are allowed for the reasons set forth in § 22 of the previous Office action.

Examiner Initiated Interview

On January 4, 2004, the Examiner contacted Mr. Burraston to propose some changes to put the case in condition for allowance. These changes were proposed to overcome 35 U.S.C. 112 issues, and to improve the overall clarity of the claims.

Changes to claims 1 and 29 include improved language describing *(i) an abrasive substrate layer*. This change improves clarity of the limitation, and it breathes life into the preamble of the claim. Support for this can be found in paragraph 0044 of the Specification.

Changes to claims 1, 10, 29, 38, 47, 48, 55, 60, 61, and 62 include improved language describing *(ii) a tacky gel layer*. This change clarifies the spatial relationship of the tacky gel layer with respect to the abrasive substrate layer.

Changes to claims 1, 10, 12, 47, 48, 55, and 61 include an additional proviso to Formulae II and III, wherein each formula must feature at least two Si-H bonds. This proviso is necessary in order for these compounds to act as cross-linking compounds in the claimed system. Support for this can be found in paragraph 0066 of the Specification.

The depended claims were amended appropriately in order to provide clear and consistent language stemming from the changes in the independent claims. In addition Formula III in claim 10 was replaced to correct a typographical error.

A fax detailing the proposed changes was sent to Mr. Burraston on January 4, 2004, and Mr. Burraston followed-up on January 8, 2004, approving the proposed changes.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Feely whose telephone number is 571-272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Michael J. Feely
Patent Examiner
Art Unit 1712


PHILIP TUCKER
PRIMARY EXAMINER
ART UNIT 1712

January 9, 2004